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A COMPARISON OF SUMMER AND WINTER FISHING IN A "BLUEGILL LAKE"

(Bear Lake, Hillsdale County)

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Introduction

An intensive creel census on Bear Lake, Hillsdale County, was conducted to determine the relative numbers of fish taken in winter and in summer.

Information regarding numbers of fish taken in winter and summer on more northerly lakes in Michigan has been made available as a result of previous studies made by the Institute (Hazzard and Eschmeyer, 1937). The same authors (1938) analyzed the fish catch for one year in lakes of the Waterloo Project Area and came to the same conclusion as a result of both investigations, i.e., that winter fishing could not be held responsible for any serious decline in summer fishing. Little was known, however, concerning the so-called "bluegill lakes" along the southern border of the state. In these lakes large catches of bluegill were reported taken

commonly in winter. Accordingly a southern lake was selected for intensive study of this question. Bear Lake was chosen because it was the concensus of opinion of residents and local representatives of the Conservation Department in Hillsdale County that this lake was typical of the area in that both summer and winter fishing were significant.

Bear Lake lies about five miles southwest of Hillsdale, Michigan, within the drainage system of the St. Joseph River tributary to the Maumee. Adjacent to it and connected with it by channels are Pike and Wilson Lakes. The shore is largely marshy and few cottages have been built. A peripheral band of marl is present, changing to pulpy peat in the deeper portions. Approximately seventy-five per cent of the bottom is pulpy peat. Large areas of shoal water are present, dropping off to a maximum depth of 53 feet. Vegetation is moderately abundant over most of the shoal area.

Following the technique developed by Eschmeyer (1935) on the northern lakes, the creel census was started shortly after the ice formed in the fall of 1937, extended through the winter to the close of the open season in the spring of 1938, and was resumed from June 25th to October 1st of that year.

The census was taken by Harold Bowditch, assisted by Conservation Officer Lyle Gates and James Scully, in charge of the Hillsdale Rearing ponds. During the more intensive summer fishing season Mr. Bowditch camped on Bear Lake and was on duty continuously.

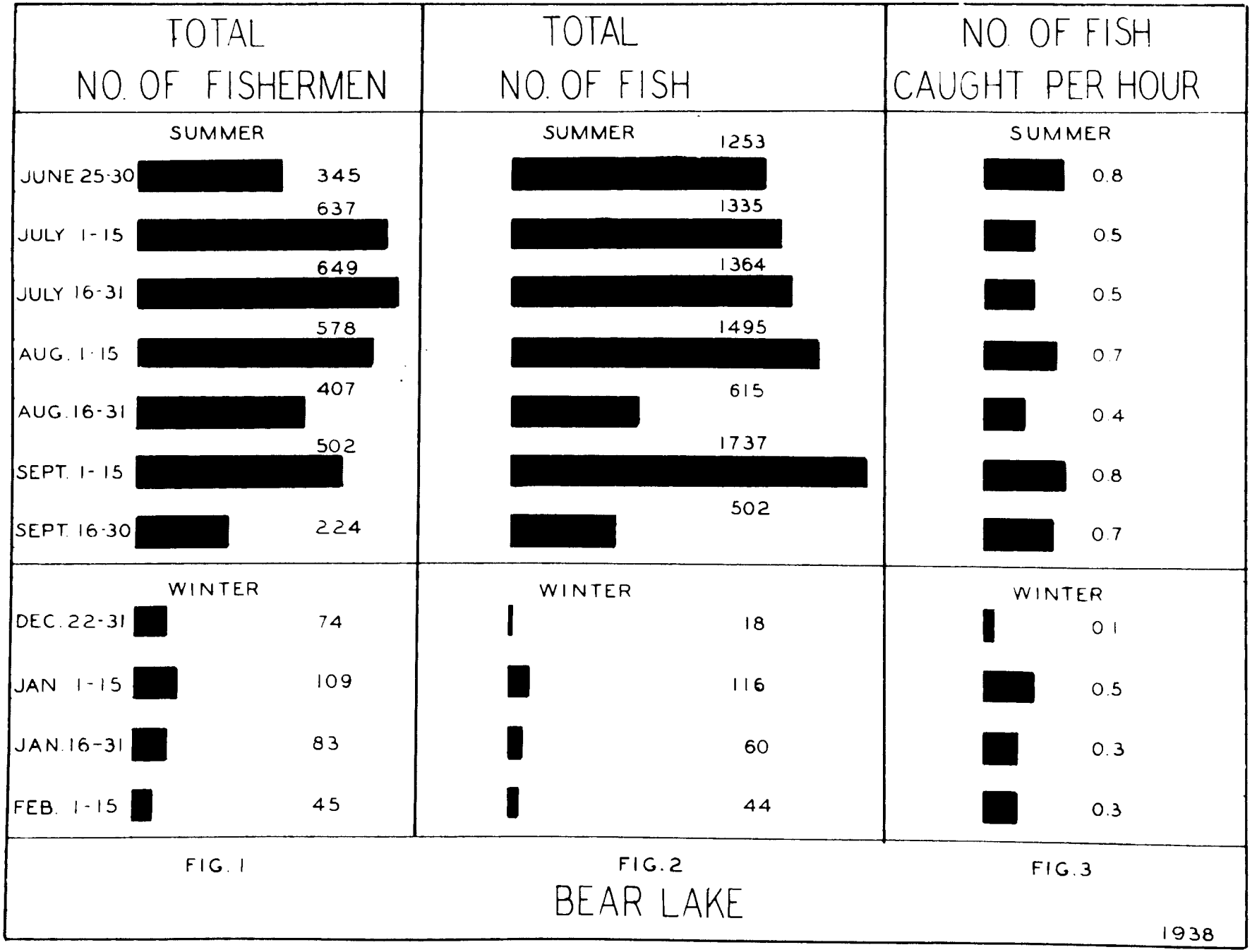
It is believed that records were secured of approximately 95 per cent of the fishing on Bear Lake. In this report no correction for this minor source of error has been made. Most of the ice fishermen from two other adjoining lakes, Pike and Fowler, passed the checking station on Bear Lake. Fairly complete records of winter fishing were therefore secured from

these lakes in addition to the census for Bear Lake. Summer fishing on Bear Lake was more difficult to check and did not permit securing complete records on Pike and Fowler Lakes. However, since many anglers entered Pike Lake by boat from Bear Lake, their reports could be secured without much additional effort and probably represent a fair sample of the summer angling. Fowler Lake is not connected by boat channel with Bear Lake and is more difficult to reach from Bear Lake, therefore summer fishing records for Fowler Lake were few. As only privately owned boats are operated on this lake, the intensity of summer fishing is very light as compared with that of winter.

Discussion of Data

The total number of fishermen on Bear Lake during the winter fishing season was 311, of which number 10 were women. The total number of fishermen on the lake from June 25th to September 30th was 3,342, of which number 706 were women. Figure 1 shows the number of fishermen by half month periods, except for fractional periods from December 22nd to December 31st, and from the opening of the season June 25th to October first.

The total number of legal-sized fish caught during the summer season was 8,301; the number of legal-sized fish taken during the winter period was 238. Figure 2 compares the summer and winter catch, and the data are tabulated by periods identical with those in Figure 1. The quality of fishing is indicated by the number of legal-sized fish taken per hour. Figure 3 shows the catch per hour for the half month periods. The census indicates that the number of fish caught per hour in summer was greater than in the winter, averaging 0.6 fish per hour for the entire summer and


TOTAL NO. OF FISHERMEN
SUMMER
JUNE 25-30
345
JULY 1-15
637
JULY 16-31
649
AUG. 1-15
578
AUG. 16-31
407
SEPT. 1-15
502
SEPT. 16-30
224
WINTER
DEC. 22-31
74
JAN 1-15
109
JAN. 16-31
83
FEB. 1-15
45
FIG. 1
TOTAL NO. OF FISH
SUMMER
1253
1335
1364
1495
615
1737
502
WINTER
18
116
60
44
FIG. 2
NO. OF FISH CAUGHT PER HOUR
SUMMER
0.8
0.5
0.5
0.7
0.4
0.8
0.7
WINTER
0.1
0.5
0.3
0.3
FIG. 3
BEAR LAKE
1938

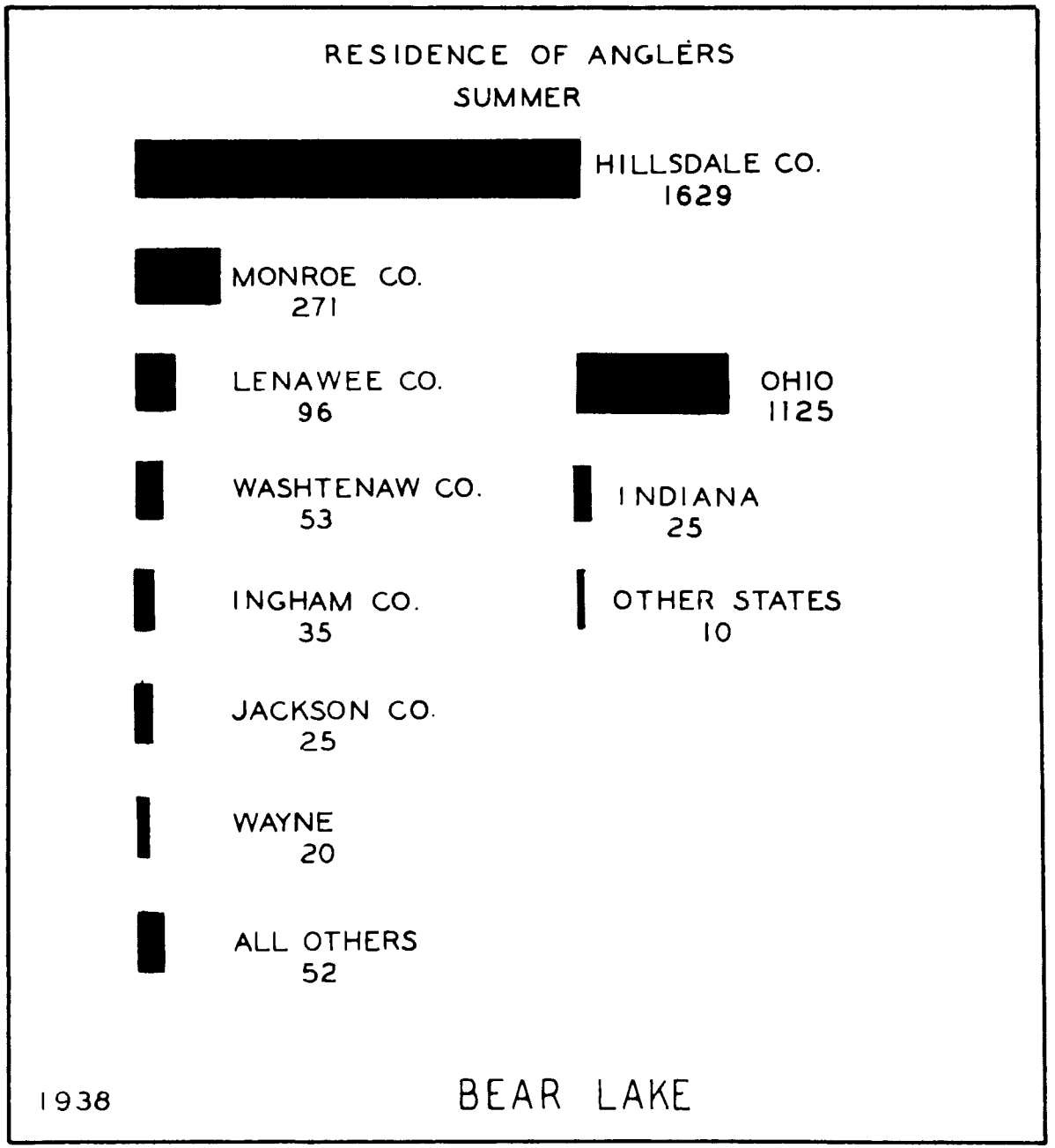

RESIDENCE OF ANGLERS
SUMMER
HILLSDALE CO.
1629
MONROE CO.
271
LENAWEE CO.
96
OHIO
1125
WASHTENAW CO.
53
INDIANA
25
INGHAM CO.
35
OTHER STATES
10
JACKSON CO.
25
WAYNE
20
ALL OTHERS
52
1938
BEAR LAKE

FIG. 4

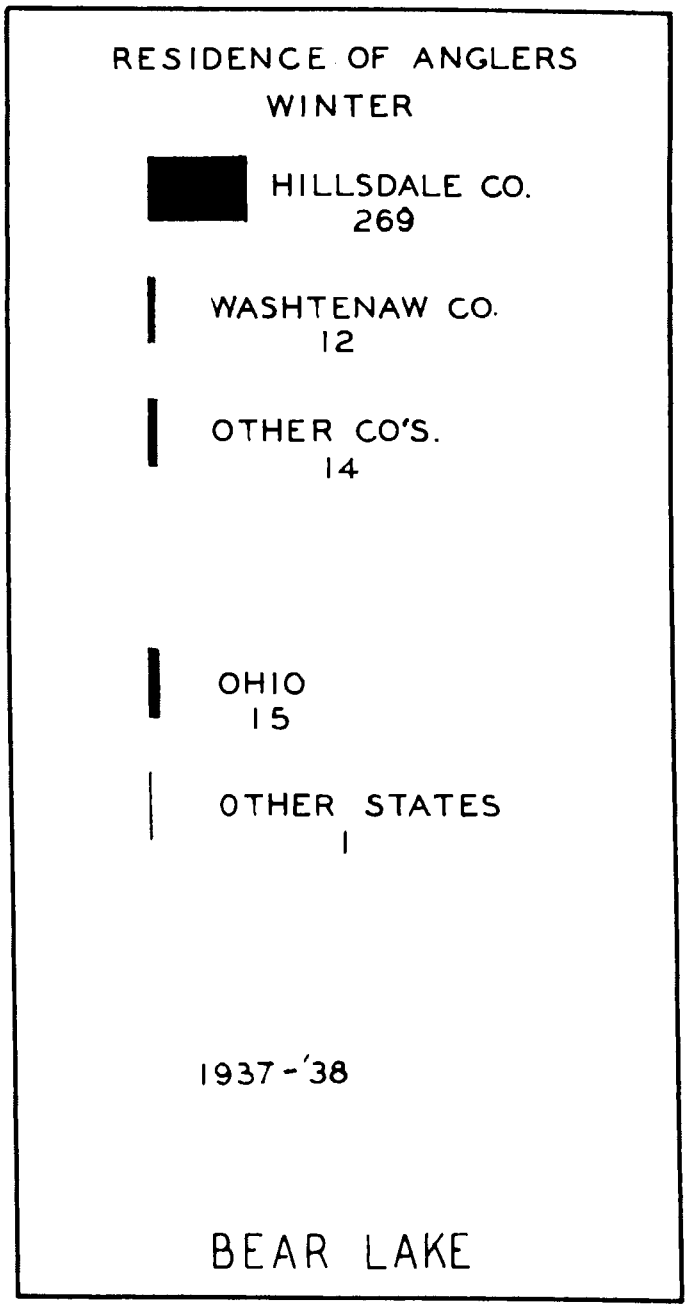

RESIDENCE OF ANGLERS
WINTER
HILLSDALE CO.
269
WASHTENAW CO.
12
OTHER CO'S.
14
OHIO
15
OTHER STATES
1
1937-'38
BEAR LAKE

FIG. 5

0.3 for the winter. Of the 3,342 summer fishermen, 1,278 or 38 per cent, took no legal-sized fish. Of the 311 winter fishermen, 240 or 77 per cent failed to take legal-sized fish. The average size of all legal fish caught in the summer period was 8.2 inches; in winter, 8.4 inches. Each angler was asked to state the number of undersized fish that he caught and returned to the water. Resulting figures show a total of 755 caught in summer, and 204 in winter. A comparison of the number of fish caught per acre of lake surface shows that for the summer period 79.8 legal-sized fish per acre were taken; for the winter 2.03 fish per acre were removed by angling. These figures are in fairly close agreement with those of Hazzard and Eschmeyer (1937) for six Michigan lakes where intensive census indicated that the summer catch was 36.0 fish per acre; that for the winter, 0.3 fish per acre.

Bear Lake attracted a rather large number of out-of-state anglers during the summer period. Of 3,342 fishermen reporting, 1,125 came from Ohio, 25 from Indiana, and 10 from other states. Of the Michigan fishermen, 1,629 listed their residence as Hillsdale County; the majority of other residents came from closely adjacent counties. Winter fishing on Bear Lake was largely confined to local residents. Two hundred sixty-nine of a total of 311 were from Hillsdale County. Only 16 were from out of the state (Figures 4 and 5).

Bluegills predominated in both the summer and winter catches (Figure 6), but whereas 5,317 were taken from the 25th of June to September 30th, only 115 were recorded for the entire winter season.

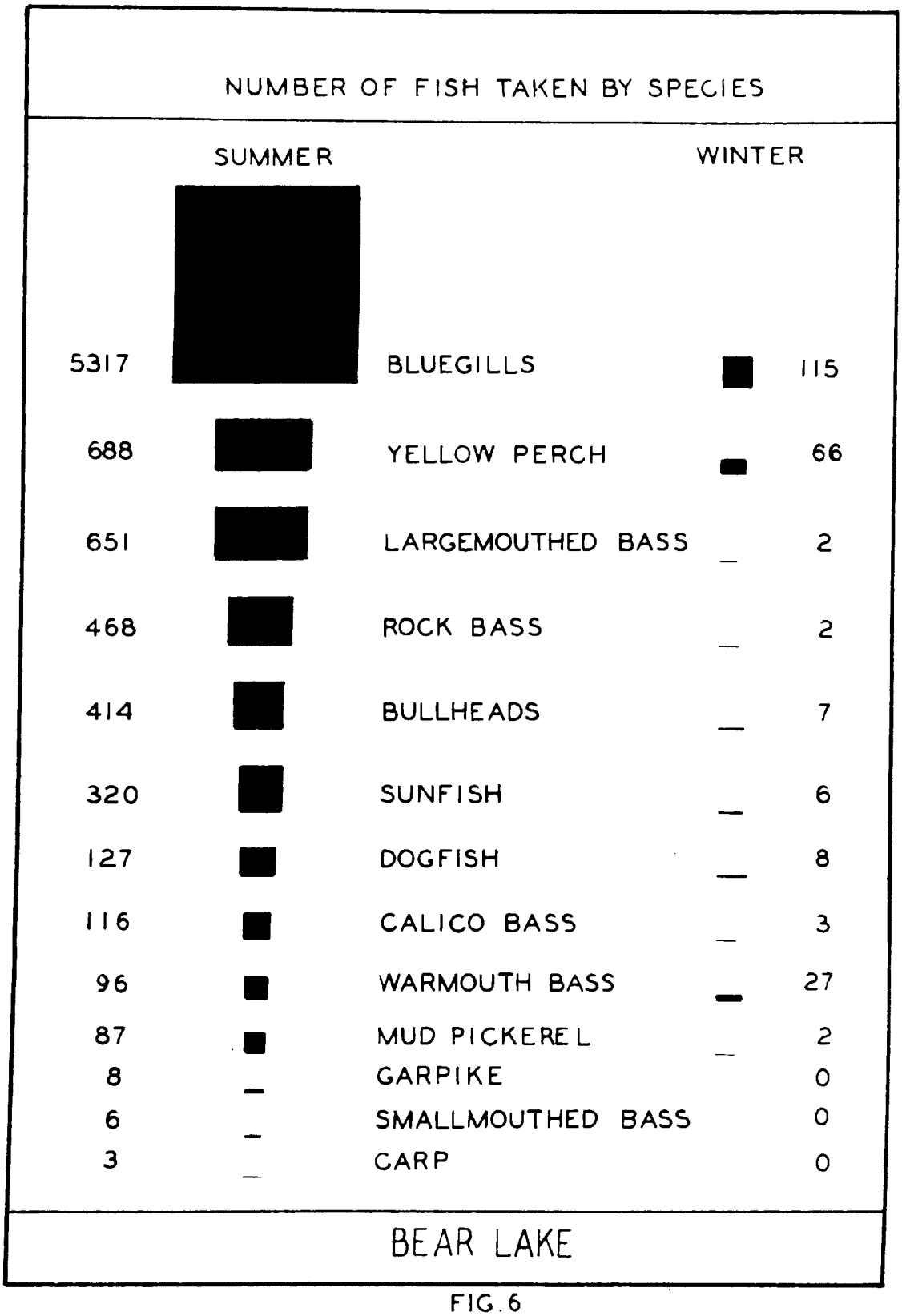

NUMBER OF FISH TAKEN BY SPECIES
SUMMER
WINTER
5317
BLUEGILLS
115
688
YELLOW PERCH
66
651
LARGEMOUTHED BASS
2
468
ROCK BASS
2
414
BULLHEADS
7
320
SUNFISH
6
127
DOGFISH
8
116
CALICO BASS
3
96
WARMOUTH BASS
27
87
MUD PICKEREL
2
8
GARPIKE
0
6
SMALLMOUTHED BASS
0
3
CARP
0
BEAR LAKE

FIG. 6

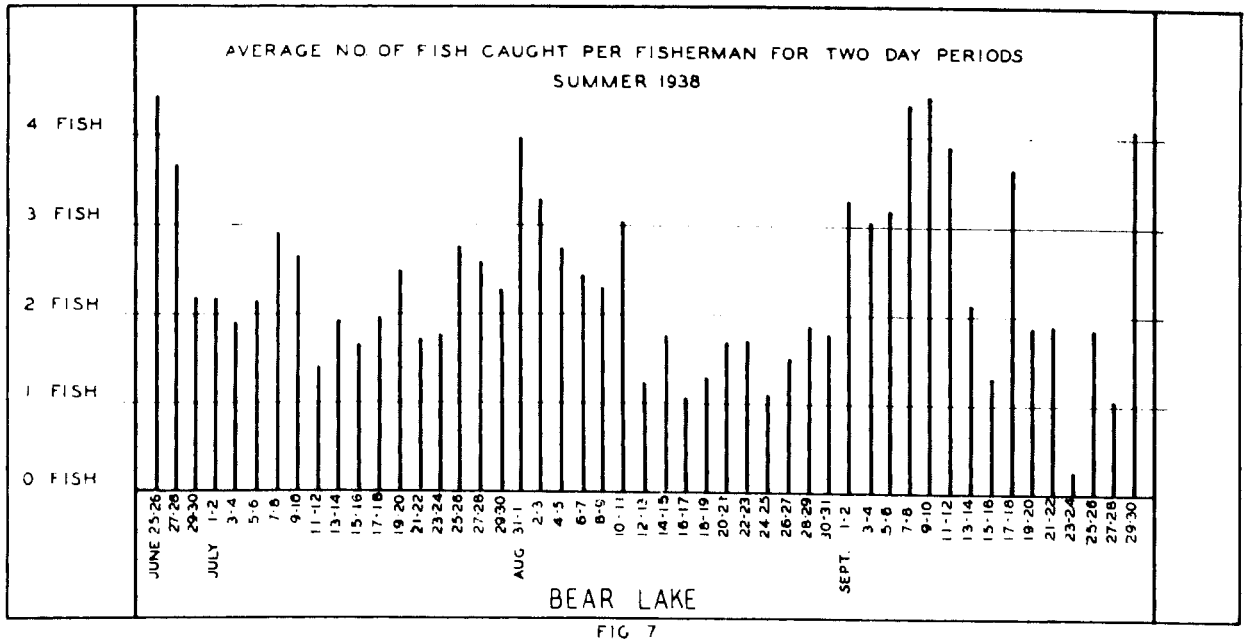

AVERAGE NO. OF FISH CAUGHT PER FISHERMAN FOR TWO DAY PERIODS
SUMMER 1938
4 FISH
3 FISH
2 FISH
1 FISH
0 FISH
JUNE 25-26
27-28
29-30
JULY 1-2
3-4
5-6
7-8
9-10
11-12
13-14
15-16
17-18
19-20
21-22
23-24
25-26
27-28
29-30
AUG 31-1
2-3
4-5
6-7
8-9
10-11
12-13
14-15
16-17
18-19
20-21
22-23
24-25
26-27
28-29
30-31
SEPT. 1-2
3-4
5-6
7-8
9-10
11-12
13-14
15-16
17-18
19-20
21-22
23-24
25-26
27-28
29-30
BEAR LAKE

FIG. 7

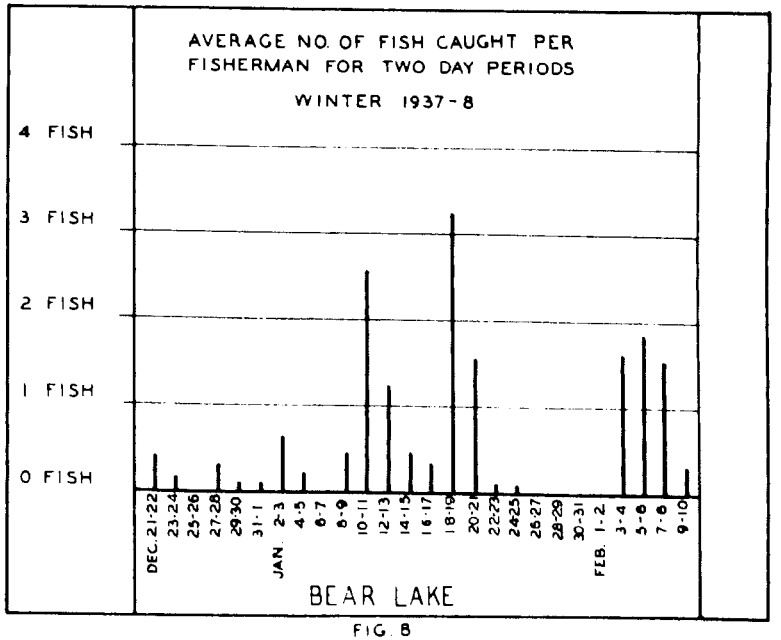

AVERAGE NO. OF FISH CAUGHT PER
FISHERMAN FOR TWO DAY PERIODS
WINTER 1937-8
4 FISH
3 FISH
2 FISH
1 FISH
0 FISH
DEC. 21-22
23-24
25-26
27-28
29-30
31-1
JAN. 2-3
4-5
6-7
8-9
10-11
12-13
14-15
16-17
18-19
20-21
22-23
24-25
26-27
28-29
30-31
FEB. 1-2
3-4
5-6
7-8
9-10
BEAR LAKE

FIG. 8

TABLE 1. NUMBERS OF INDIVIDUAL SPECIES TAKEN, AND AVERAGE SIZE IN SUMMER AND WINTER CATCHES FROM BEAR LAKE

Species	Summer		Winter	
	Number	Average Size	Number	Average Size
Bluegill (Lepomis machrochirus)	5,317	7.5	115	7.6
Yellow perch (Perca flavescens)	688	7.8	66	8.8
Largemouthed bass (Huro salmoides)	651	12.7	2	13.0
Rock bass (Ambloplites rupestris)	468	7.4	2	7.5
Bullhead (Ameiurus sp.)	414	9.9	7	9.3
Sunfish (Lepomis gibbosus)	320	6.6	6	7.2
Dogfish (Amia calva)	127	15.3	8	22.1
Calico bass (Pomoxis nigro-maculatus)	116	10.3	3	8.0
Warmouth bass (Chaenobryttus gulosus)	96	7.0	27	6.5
Mud pickerel (Esox vermiculatus)	87	11.1	2	14.0
Garpike (Lepidosteous osseous)	8	20.1	...	...
Smallmouthed bass (Micropterus dolomieu)	6	13.6	...	...
Carp (Cyprinus carpio)	3	15.2	...	...

In Figures 7 and 8 the average number of fish per fisherman for two day periods for the summer and winter is plotted to show variations in take throughout the seasons. The beginning of the summer season started with a high point in excess of 4 fish per day for the first two day period. The curve then drops sharply, and with minor fluctuations, reaches a low about the 13th of July. A rise follows, reaching a second high the 1st of August, dropping again to a second low around the 21st of August, again rising to a point as high as it was at the first of the season, around the ninth of September when another falling off occurs. In the summer fishing (Figure 7) this successive re-occurrence of highs and lows appears to be quite regular indicating a 38 day period between points of the greatest average catch per day, and a similar period between the points of the least average catch per day.

Figure 8 for the winter fishing, shows two periods of greatest activity, but the number of fishermen on the lake during the winter season was not large enough to furnish a valid analysis.

An attempt was made to correlate these curves with weather condition but with no positive results. Barometric pressures were obtained for the entire period of the census operation on Bear Lake. These records of pressure were from the University of Michigan Observatory at Ann Arbor, Michigan, a distance of approximately 75 miles east of Bear Lake. The maximum and minimum barometric readings for 24 hour periods, as well as the pressure range, were plotted but no correlation could be found between atmospheric pressure variations and the degree of fishing success. Air temperature records were taken by Mr. Bowditch for the entire census period on Bear Lake. These were recorded at 9 a.m. and at 3 p.m. daily. Separate graphs were made for the morning temperatures and for the afternoon temperatures, and compared with the average number of fish caught per day per fisherman for the same period. Daily maximum and minimum temperatures were obtained from the University of Michigan Observatory at Ann Arbor for this same period. These two temperature series were plotted and compared with the average number of fish caught per day per fisherman on Bear Lake. Surface water temperatures were also taken at Bear Lake from June 29 to October first. No correlation was found to exist between any of these temperature curves and the fish catch.

In addition to comparisons of the total catch with weather records, the average catch per hour was analyzed with respect to wind velocity, wind direction, degree of cloudiness, maximum and minimum temperatures and barometric pressures to determine whether any correlation existed. There appears to be no single weather condition or combination of factors common to either good or poor fishing.

Analyses in like manner of the weather condition for the days preceding the days of best fishing, and for the days preceding the poorest fishing likewise showed no correlations.

Partial Data for Pike and Fowler Lakes

Although a complete record of fishing on Pike and Fowler Lakes was not secured either in winter or summer a good sample of both was obtained from Pike Lake. Reports from 314 fishermen in summer revealed a total catch of 1,044 legal fish (59 per acre) taken at the rate of 0.9 fish per fisherman-hour. In winter, 304 records showed that 650 legal fish (34 per acre) were caught at a rate of 0.8 fish per hour. Bluegills made up the bulk of the catch at both seasons.

Five records of summer fishing secured from Fowler Lake showed a catch of 1.6 fish per hour compared with 1.2 fish per hour in winter (104 records). Bluegills were in the majority both in summer and winter.

Summary and Conclusions

1. As a result of intensive creel census taken by Conservation Department employees a comparison was made of the fishing during the winter of 1937-38 and the summer of 1938. Although selected as a typical southern bluegill lake "runs" of fish failed to develop during this winter; 238 fish were taken by 311 fishermen.

2. Census during the following summer, however, proved that the fish were there even though they did not bite as a total of ~~5,317~~ 8,301 fish were reported taken by 3,342 anglers from June 25 to October first. More fish were taken on one of the best summer's fishing days than were caught all winter.

3. The catch per fisherman-hour in winter for Bear Lake was 0.3; the fishing in summer was exactly twice as good. Seventy-seven per cent of winter fishermen took no legal-sized fish; in summer 38 per cent failed to score.

4. Two hundred and four under-sized fish were caught in winter as compared with 755 in summer.

5. The number of legal-sized fish taken per acre from Bear Lake was 2.03 in winter as compared with 79.8 in summer.

6. Bluegills predominated in both winter and summer catch.

7. No correlation could be discovered between the quality of the fishing and the following: water temperatures, barometric pressure, air temperature, wind direction and wind velocity. A fairly definite cycle with peaks and lows at intervals of 38 days seemed apparent in the summer fishing for Bear Lake.

8. Analysis of partial data from two connecting lakes, Pike and Fowler, tends to confirm results secured on Bear Lake.

9. A comparison of the fishing in summer and winter on Bear Lake and two connecting lakes indicates that winter fishing on these lakes during 1937-38 had no detrimental effect upon fishing during the following summer. This conclusion is in agreement with findings on other lakes previously investigated.

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